

## SEQUENCE LISTING

&lt;110&gt; CNRS

<120> NUCLEOTIDE SEQUENCES DERIVED FROM GENES CODING FOR  
TRIMETHYLAMINE N-OXYDE REDUCTASE, AND USES THEREOF,  
ESPECIALLY FOR THE DETECTION OF BACTERIA

&lt;130&gt; WOB 99 AX CNR DORA

&lt;140&gt;

&lt;141&gt;

&lt;150&gt; FR9911543

&lt;151&gt; 1999-09-15

&lt;160&gt; 27

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 2487

&lt;212&gt; DNA

&lt;213&gt; Shewanella massilia

&lt;400&gt; 1

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<211> 2486

<212> DNA

<213> *Shewanella putrefaciens*

<400> 2

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<210> 3

<211> 2487

<212> DNA

<213> *Schewanella c*

<400> 3

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<210> 4

<211> 1080

<212> DNA

<213> Artificial sequence

<220>

<223> Description of the artificial sequence: partial  
sequence coding for the TorA protein of  
*Photobacterium phosphoreum*

<400> 4

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<210> 5

<211> 392

<212> PRT

<213> Shewanella massilia

<400> 5

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Ile Phe Trp Gly Gly Phe Asn Thr Ala Leu Glu Ala Thr Asn Thr Glu
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Ala Phe Cys Ile Ser Cys His Ser Met Glu Ser Lys Pro Tyr Gln Glu
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Leu Gln Glu Thr Val His Trp Ser Asn His Phe Gly Val Arg Ala Thr
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Cys Pro Asp Cys His Val Pro His Asn Trp Ser Arg Lys Ile Ala Arg
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Lys Met Glu Ala Ser His Asp Val Trp Gly Trp Leu Phe Asn Thr Val
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Asn Thr Pro Glu Lys Phe Glu Ala Lys Arg Leu Glu Met Ala Ser Arg
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Glu Trp Lys Arg Phe Asp Arg Asp Asn Ser Leu Ala Cys Lys Asn Cys
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His Asn Tyr Asn Ser Met Lys Trp Glu Ala Met Ser Pro Leu Ala Gln
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Lys Gln Met Lys Arg Ala Ala Glu Ile Asp Gln Ser Cys Ile Asp Cys
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His Lys Gly Ile Ala His His Leu Pro Glu Met Gly Thr Ala Arg Ala
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 Asn Gln Thr Tyr Tyr Ser Ala Leu Thr Lys Pro Leu Phe Phe Thr Asp  
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 Lys Gly Asp Val Glu Ala Gly Thr Leu Asn Val Ala Thr Lys Val Lys  
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 Val Leu Glu Thr Gln Gly Lys Arg Ile Lys Ile Gly Ile Asp Gly Trp  
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 Arg Lys Lys Ile Gly Ala Gly Arg Val Ile Tyr Met Asp Phe Gly Val  
 260 265 270  
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 275 280 285  
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 Trp Gln Arg Ile Glu Ala Gln Ile Trp Thr Asp Lys Asp Tyr Leu Leu  
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 Asn Thr Trp Pro Gly Met Phe Gln Gly Met Leu Ala Phe Val Asn Met  
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<211> 2523

<212> DNA

<213> Rhodobacter sphaeroides

<400> 6

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gcgaaggtga gcgacgcggt gatgccgggc gcgatccagg tctacgaggg cggctggtag 2340
gacccgctcg acccctcgga ggaaggcacg ctcgacaaat acggcgacgt gaacgtgctg 2400
tcgctcgacg tcggcacctc gaagctggcg cagggcaact gcggccagac catcctcgcg 2460
gatgtcgaaa aatatgcggg gcgcgccggt acggtgaccg tgttcgacac gccgaaggga 2520
ccc

```

<210> 7

<211> 2475

<212> DNA

<213> Rhodobacter capsulatus

<400> 7

```

atgacgaagt tttccggaaa cgagctgcgc gcagagcttt accgccgcgc tttcctcagc 60
tactcggttg caccgggcgc gctgggcatg ttccggccgt cgcttctggc caagggcgcc 120
cgcccgagg cgctggccaa tggcacggtg atgtcgggca gccactgggg cgtctttacc 180
gcgacggtcg aaaacggccg cgccaccgcc ttacccccct gggaaaaaga cccgcatccg 240
acgccgatgc tgggaaggcg gctggactcg atctattcgc cgacgcggat caaatatccg 300
atggtgcggc gcgaattcct cgaaaaaggc gtgaatgctg atcgctccac ccgcggcaac 360
ggcgattttc gtcccgtcag ctgggatcag gcgctcgatc tgcatggctg cggcgaggtc 420
aaacgggtcg aaggagacct acggcccgca ggcgtctttg gcggctccta tggctggaaa 480
agccccgggc ggctgcacaa ttgcaccacg cttctgcgcc gcatgctgac gctggcgggc 540
ggctatgtga acggcgcggg cgattattcg accggcgcg cgagggtgat catgccgcat 600
gtggtcggca cgctggaagt ctatgaacag cagaccgcct ggccggtgct ggcggaaac 660
accgaagtca tgggtgtctg ggccgccgat ccgatcaaga cagcagatat cggctgggtg 720
tatccogaac atggcgccca tccggggact gaggcgtca aggccaagg caccaaggtc 780
atcgteatcg atccggtccg caccaagacg gtcgaattct tcggcgcgga tcacgtcacg 840
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gacctgtatg taaaggactt catcgccaac tacacctcgg gcttcgacaa gttcctgccc 960
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ggcgttccgg ccgagacgat caaggaaact gcgcggctgt tcaaactgaa acgcacgatg 1080
ctggcgggcg gctggtcgat gcagcggat catcacggcg agcaggcgca ttggatgctg 1140
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tatcactatt cgggcggtg cagccctcgc agcagcggtc cggcgctttc gggcatcacc 1260
gatggcgggc gacgaagggg ccggaatggc tggcgggcag cggcgcttcg gtgtatccc 1320
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cggtcgaaat tcccggatgt gaagatggcc tattgggttg gcggaacccc ttcgtgtcac 1440

```

```

catcaggacc gcaaccgcat ggtcaaggcc tgggaaaaaac tggaaacctt catcgtgcat 1500
gacttccagt ggacgcccac ggcgcggcat gccgacatcg tgctgcccgc gacgaccagc 1560
tatgaacgca acgacatcga gacgatcggc gattattoga acaccggcat cctggcgatg 1620
aagaagatcg tcgagccgct ttacgaagcc cgcagcgatt acgacatctt cgccgcgggtc 1680
gccgaacggc tgggcaaggg caaggagttc accgaaggca aggacgagat gggctggatc 1740
aagtccttct acgacgatgc cgccaagcag gcaaagcggg ggtcgagatg ccccgcccttc 1800
gacgccttct gggcggaagg gatcgtggaa ttcccgggtca ccgacggcgc ggacttcgtg 1860
cgctatgcc a gcttccggga agatccgctg ctcaaccgcg tgggcacgcc gaccggcctg 1920
atcgagatct actcgaagaa catcgagaag atgggctatg acgactgccg ggcgcatccg 1980
acctggatgg aaccgcttga acggctcgac gggccggggg cgaaatatcc gctgcacatc 2040
gcggctcgca cccgttcaac cgggtgtact gcacccgttc accggctcaa cggcacggtg 2100
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gcccgcgcgc gcatcgccga tggcgacgtg gtgcgggtgc acaatgatcg cggtcagatc 2220
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gcgaaggcgg tcgaa 2475

```

<210> 8  
 <211> 404  
 <212> PRT  
 <213> Rhodobacter sphaeroides

<400> 8  
 Met Gly Arg Ser Cys Gly Gln Ala Ser Glu Ala Lys Val Ile Gly Arg  
     1                    5                    10                    15  
 Ile Trp Lys Ala Phe Trp Arg Pro Ser Thr Lys Trp Gly Leu Gly Val  
                     20                    25                    30  
 Leu Leu Val Thr Gly Gly Ile Ala Gly Ala Val Gly Trp Asn Gly Phe  
                     35                    40                    45  
 His Tyr Val Val Glu Lys Thr Thr Thr Thr Glu Phe Cys Ile Ser Cys  
                     50                    55                    60  
 His Ser Met Arg Asp Asn Asn Tyr Glu Glu Tyr Lys Thr Thr Ile His  
                     65                    70                    75                    80  
 Tyr Gln Asn Thr Ser Gly Val Arg Ala Glu Cys Ala Asp Cys His Val  
                     85                    90                    95  
 Pro Lys Ser Gly Trp Lys Leu Tyr Arg Ala Lys Leu Leu Ala Ala Lys  
                     100                    105                    110  
 Asp Leu Trp Gly Glu Ile Arg Gly Thr Ile Asp Thr Arg Glu Lys Phe  
                     115                    120                    125  
 Glu Ala His Arg Leu Glu Met Ala Glu Thr Val Trp Ala Asp Met Lys  
                     130                    135                    140  
 Ala Asn Asp Ser Ala Thr Cys Arg Thr Cys His Ser Phe Glu Ala Met  
                     145                    150                    155                    160  
 Asp Phe Ala His Gln Lys Pro Glu Ala Ser Lys Gln Met Gln Gln Ala  
                     165                    170                    175  
 Met Asn Glu Gly Gly Thr Cys Ile Asp Cys His Lys Gly Ile Ala His  
                     180                    185                    190

Lys Met Pro Asp Met Ala Ser Gly Tyr Arg Ala Leu Phe Ser Lys Leu  
195 200 205

Glu Lys Ala Ser Gln Ser Leu Lys Pro Arg Lys Gly Glu Thr Leu Tyr  
210 215 220

Pro Leu Arg Thr Ile Glu Ala Tyr Leu Glu Lys Pro Ser Gly Glu Lys  
225 230 235 240

Ala Lys Ala Asp Gly Arg Leu Leu Ala Ala Thr Pro Met Gln Val Val  
245 250 255

Asp Val Thr Gly Asp Trp Val Gln Val Ala Val Lys Gly Trp Gln Gln  
260 265 270

Glu Gly Ala Glu Arg Val Ile Tyr Glu Lys Gln Gly Lys Arg Ile Phe  
275 280 285

Asn Ala Ala Leu Ala Pro Ala Ala Thr Gly Ser Val Val Pro Gly Ala  
290 295 300

Ser Met Val Asp Pro Asp Thr Glu Gln Thr Trp Thr Asp Val Ser Leu  
305 310 315 320

Thr Ala Trp Val Arg Asn Arg Asp Leu Thr Gly Asp Gln Glu Ala Leu  
325 330 335

Trp Gln Tyr Gly Lys Gln Met Tyr Asn Gly Ala Cys Gly Met Cys His  
340 345 350

Val Leu Pro His Pro Glu His Phe Leu Ala Asn Gln Trp Ile Gly Thr  
355 360 365

Leu Asn Ala Met Lys Ser Arg Ala Pro Leu Asp Asp Glu Gln Phe Arg  
370 375 380

Leu Val Gln Arg Tyr Val Gln Met His Ala Lys Asp Val Glu Pro Glu  
385 390 395 400

Gly Ala Ala Glu

<210> 9  
<211> 2544  
<212> DNA  
<213> Escherichia coli

<400> 9  
atgaacaata acgatctctt tcaggcatca cgtcggcggt ttctggcaca actcggcggc 60  
ttaaccgctc cccgggatgct ggggccgtca ttgttaacgc cgcgacgtgc gactgcggcg 120  
caagcggcga ctgacgctgt catctcgaaa gagggcattc ttaccgggtc gcaactgggg 180  
gctatcccg cgcggtgaa ggatggctgc tttgtggcgg cgaaaccgtt cgaactggat 240  
aaatatccgt cgaaaatgat tgccggattg ccggatcacg tacacaacgc ggcgcgtatt 300  
cgttatccga tggtagcgt ggactggctg cgtaagcgcc atctcagcga tacctcccag 360  
cgcggtgata accgttttgt gcgcgtgagc tgggatgaag ccctcgacat gttctatgaa 420  
gaactggaac gcgtgcagaa aactcacggg ccgagtgcct tgctgaccgc cagtgggttg 480  
caatcgacgg ggatgttcca taacgcttcg gggatgcgtg cgaaacgtat tgccttgcat 540  
ggtaatatgcg ttggtacggg cggagattac tctaccggtg ctgcgcaggt gatcctgccc 600

```

cgcgtagtcg gttc gatgga agtgtatgaa cagcaaacct cctggccgct ggtattgcag 660
aacagcaaaa ccattgtgct gtggggctcc gatttgctga aaaaccagca agcgaactgg 720
tggtgcccgg atcacgatgt ttatgaatat tacgcgcagc taaagcgaaa gtcggccgcc 780
ggtgaaattg aggtcatcag catcgatccg gttgtcacat ccacccatga gtatctgggc 840
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ctggcacata cgctgtacag tgaaaacctg tacgacaaaa acttccttgc taactactgt 960
gtgggttttg aggagttcct gccgtatctg ctgggtgaga aagacggtca gccgaaagat 1020
gccgcatggg ctgaaaaact gagcggcatt gatgccgaaa ccattcgtgg gctggcgcg 1080
cagatggcgg cgaacagaac gcaaattatt gctggctggg gcgtgcagcg tatgcagcac 1140
ggtgaacagt gggcgtggat gattgtggtt ctggcggcga tgctggggca aattggcctg 1200
ccaggtggtg gttttggttt tggctggcac tacaacggcg caggcacgcc gggcgtaaa 1260
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atTTTTGCCG gaactaacc attccatcg catcagcaga tcaaccgcat tattgaaggc 1500
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gccgatatcg tactgcctgc gaccacgcag tttgagcgta acgatctcga ccagtacggc 1620
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cgcaacgact tcgatatttt ccgcgagctg tgccgtcgt ttaatcgca agaagccttt 1740
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gtcgagtttg accatccgca gatgtttgtt cgccaccagg cattccgcga agatccggat 1920
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gcacccggcg tggcagcaat tcacgaagg gcatggtacg atccagataa aggcggcgag 2340
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cagctcgcgc aggcgaccag tgcgcacact acgctggtgg aaattgagaa gtacaacgga 2460
acagtggagc aggtgacggc gtttaacggc cccgtggaga tgggtggcgca gtgcgaatat 2520
gttcccgcgt cgcaggtgaa atca 2544

```

<210> 10

<211> 477

<212> DNA

<213> Artificial sequence

<220>

<223> Description of the artificial sequence: partial  
sequence coding for the protein TorA of  
*Salmonella typhimurium*

<400> 10

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atgaaacagg tgggtgcgcc gcagtttgaa gcgcgtaacg actttgatat tttccgcgat 60
ctctgccgac gctttaaccg tgaagcggca ttcacggaag gtcttgatga aatgggctgg 120
ctgaaacgca tctggcagga agggagccag cagggaagaa gtcgcgggat ccacttaccg 180
atTTTCGAGG tgTtctggaa tcaacaggag tacatcgagt ttgatcatcc gcagatgttt 240
gtacgccatc aggctttccg tgaagatccg gacctggagc cgttgggcac gccaaagcgg 300
ttgatcgaga tttactccaa aaccatcgcc gacatgcaat acgacgatgg tcagggccat 360
cccatgtggg tcgaaaaaat cgaacgctcg catggcgggc cgggatcgca gcgctggccg 420
ctgcacttac aatccgtcca cctgatttc cgtctgcatt cccaactgtt gcgagtc 477

```

<210> 11

<211> 390

<212> PRT

<213> *Escherichia coli*

&lt;400&gt; 11

Met Arg Lys Leu Trp Asn Ala Leu Arg Arg Pro Ser Ala Arg Trp Ser  
 1 5 10 15

Val Leu Ala Leu Val Ala Ile Gly Ile Val Ile Gly Ile Ala Leu Ile  
 20 25 30

Val Leu Pro His Val Gly Ile Lys Val Thr Ser Thr Thr Glu Phe Cys  
 35 40 45

Val Ser Cys His Ser Met Gln Pro Val Tyr Glu Glu Tyr Lys Gln Ser  
 50 55 60

Val His Phe Gln Asn Ala Ser Gly Val Arg Ala Glu Cys His Asp Cys  
 65 70 75 80

His Ile Pro Pro Asp Ile Pro Gly Met Val Lys Arg Lys Leu Glu Ala  
 85 90 95

Ser Asn Asp Ile Tyr Gln Thr Phe Ile Ala His Ser Ile Asp Thr Pro  
 100 105 110

Glu Lys Phe Glu Ala Lys Arg Ala Leu Leu Ala Glu Arg Glu Trp Ala  
 115 120 125

Arg Met Lys Glu Asn Asn Ser Ala Thr Cys Arg Ser Cys His Asn Tyr  
 130 135 140

Asp Ala Met Asp His Ala Lys Gln His Pro Glu Ala Ala Arg Gln Met  
 145 150 155 160

Lys Val Ala Ala Lys Asp Asn Gln Ser Cys Ile Asp Cys His Lys Gly  
 165 170 175

Ile Ala His Gln Leu Pro Asp Met Ser Ser Gly Phe Arg Lys Gln Phe  
 180 185 190

Asp Asp Val Arg Ala Ser Ala Asn Asp Ser Gly Asp Thr Leu Tyr Ser  
 195 200 205

Ile Asp Ile Lys Pro Ile Tyr Ala Ala Lys Gly Asp Lys Glu Ala Ser  
 210 215 220

Gly Ser Leu Leu Pro Ala Ser Glu Val Lys Val Leu Lys Arg Asp Gly  
 225 230 235 240

Asp Trp Leu Gln Ile Glu Ile Thr Gly Trp Thr Glu Ser Ala Gly Arg  
 245 250 255

Gln Arg Val Leu Thr Gln Phe Pro Gly Lys Arg Ile Phe Val Ala Ser  
 260 265 270

Ile Arg Gly Asp Val Gln Gln Gln Val Lys Thr Leu Glu Lys Thr Thr  
 275 280 285

Val Ala Asp Thr Asn Thr Glu Trp Ser Lys Leu Gln Ala Thr Ala Trp  
 290 295 300

Met Lys Lys Gly Asp Met Val Asn Asp Ile Lys Pro Ile Trp Ala Tyr  
 305 310 315 320

[illegible]

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<210> 12
<211> 21
<212> DNA
<213> Artificial sequence
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```
<220>
<223> Description of the artificial sequence:
      PCR primer
```

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<400> 12
cggvgaytac tcbachggtg c
```

21

```
<210> 13
<211> 20
<212> DNA
<213> Artificial sequence
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```
<220>
<223> Description de of the artificial sequence:
      PCR primer
```

```
<400> 13
atygatgcga tyctcgaacc
```

20

```
<210> 14
<211> 25
<212> DNA
<213> Artificial sequence
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```
<220>
<223> Description of the artificial sequence:
      PCR primer
```

```
<400> 14
cgtamwsgtc gakatcgtr cgctc
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25

```
<210> 15
<211> 20
<212> DNA
<213> Artificial sequence
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<220>  
 <223> Description of the artificial sequence:  
     PCR primer

<400> 15  
 gactcacaya wytgygagtg 20

<210> 16  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> Description of the artificial sequence:  
     PCR primer

<400> 16  
 tgrccdcgrk cgttaaagac 20

<210> 17  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> Description of the artificial sequence:  
     PCR primer

<400> 17  
 ccvggttcga gratcgcatc 20

<210> 18  
 <211> 16  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Description of the artificial sequence:  
     PCR primer

<400> 18  
 cbgayatcst rctgcc 16

<210> 19  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> Description of the artificial sequence:  
     PCR primer

<400> 19  
 ggmgaytayt cbacmggygc 20

<210> 20

<211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
 PCR primer

<400> 20  
 twygarcgya acgaymtcga

20

<210> 21  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
 PCR primer

<400> 21  
 ggvyctacc abscvccttc

20

<210> 22  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
 PCR primer

<400> 22  
 atcarrccns wvggcgtgcc

20

<210> 23  
 <211> 17  
 <212> DNA  
 <213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
 PCR primer

<400> 23  
 gbcacrtcdg tytgygg

17

<210> 24  
 <211> 20  
 <212> DNA  
 <213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
 PCR primer

<400> 24

acnccngara arttygargc

20

<210> 25

<211> 20

<212> DNA

<213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
PCR primer

<400> 25

tgyathgayt gycayaargg

20

<210> 26

<211> 20

<212> DNA

<213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
PCR primer

<400> 26

ccytttrtgrc artcdatrca

20

<210> 27

<211> 17

<212> DNA

<213> Artificial sequence

<220>

<223> Description of the artificial sequence:  
PCR primer

<400> 27

ttngcrtcra artgngc

17